

LESSER SANDHILL CRANE (*Grus canadensis canadensis*)

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Criteria Scores

Population Trend	Range Trend	Population Size	Range Size	Endemism	Population Concentration	Threats
0	10	5	5	0	5	15

Special Concern Priority

Currently considered a Bird Species of Special Concern (wintering), Priority 3. Not included on CDFG's (1992) unprioritized list, but sandhill crane included on Remsen's (1978) original list: however, subspecific designation not listed.

Breeding Bird Survey Statistics for California

No Lesser Sandhill Cranes breed in California.

General Range and Abundance

For the subspecies in general, Lesser Sandhill Cranes breed from northeastern Siberian, northern Alaska, northern Mackenzie, Banks and Baffin islands, south to Nushagak and Cook Inlet, Alaska, southern Mackenzie, southern Keewatin, and Southhampton Island (AOU 1957). The subspecies winters in the southwestern United States, California, and Mexico. Greatest wintering concentrations occur in northwestern Texas and northern Mexico (Lewis 1977).

Lesser Sandhill Cranes comprise two recognized populations; the Mid-continent (MCP) breeds in northeastern Siberia, western and northern Alaska, and northern Canada and winters in central Kansas, Texas, New Mexico, southeastern Arizona, and northern Mexico (Drewien and Lewis 1987). Of the estimated 375,000 or so lessers world-wide, 350,000 (93%) are members of the MCP (Krapu 1981). The Pacific Flyway Population (PFP) breeds in southern Alaska from the Bristol Bay lowlands east to Cook Inlet. The Killbuck Mountains of southwestern Alaska apparently separate the breeding range of the PFP from the MCP (Littlefield 1999). An estimated 25,000 lessers are affiliated with the PFP (Littlefield and Thompson 1981).

PFP lessers migrate across southern Alaska, southeast to near Ketchikan in autumn; at this point an estimated 20,000-23,000 turn inland (eastern segment) into interior British Columbia, then south through eastern Washington, eastern Oregon, and northeastern California. Crossing the Sierra Nevada Range, they usually enter the Central Valley near Merced, Merced County. The eastern segment winters on the Delta and in the San Joaquin Valley from northwest of Lodi, San Joaquin County, southeast to the Carrizo Plains, San Luis Obispo County. A second route is used by an estimated 3800 or so birds (coastal segment). Leaving southeastern Alaska in autumn, coastal lessers migrate along the British Columbia coast and enter northwestern Washington near or over Cape Flattery. Leaving the coast they fly inland over western Washington to a traditional staging area (primarily near Vancouver, Washington and adjacent Sauvie Island, Oregon). Approximately 620 km separate this staging area from their wintering grounds. As far as known, the coastal segment still winters in the Sacramento Valley, from near Red Bluff, Tehama County, south into Butte County (Littlefield 1999).

Seasonal Status in California

The majority of Lesser Sandhill Cranes arrive in California in October, with a few as early as mid-September. For example in the San Joaquin Valley at Merced National Wildlife Refuge (NWR), mean arrival for 7 yrs between 1970-1993 was 13 September ($SD = 2.79$), with the earliest 9 September 1990 (Merced NWR unpubl. narrative reports). The earliest known arrival for the Sacramento Valley is 17 October 1970, but data there are limited.

Most lessers concentrate near Merced NWR in autumn, but later some disperse to the northwest and others southeast (Littlefield and Thompson 1981). For 8 yrs, numbers at Merced NWR peaked on the mean of 3 November ($SD = 12.07$), ranging from 23 October (1998) to 22 November (1989). Dispersal generally occurred after mid-November. For example, to the north 828 lessers were on the Delta 14 December 1969~ but had increased to 4100 by 7 January 1970, whereas at the southern extremity of their range, 1011 had reached the Carrizo Plains by the 24

November 1969, 1439 by 17 December 1969, and 2763 by 25 January 1970 (Littlefield and Thompson 1981).

Lesser Sandhill Crane seasonal status is poorly documented for the Sacramento Valley, but based on records at two locations over an extended period, birds may now be shifting southward as the season progresses. On 5 November 1970, 173 were feeding, in grasslands 16 km east of Red Bluff, Tehama County, and between 27 January-4 February 1992, 248 fed on waste rice about 32 km SSW of Chico, Butte County. Birds were not seen in this area earlier in the year, nor had they been seen in past years; CBC data suggest cranes stopped wintering in the Red Bluff area after 1992. The latter site is about 120 km SSE of Red Bluff (Littlefield 1999).

Mean latest spring departure at Merced NWR is 1 April ($SD = 17.87$, $N = 5$ yrs), but most leave the Central Valley in late February and early March (Littlefield 1999, pers. obs.). In spring, migration routes are similar to those of autumn.

Historical Range and Abundance in California

Grinnell and Miller (1944) described the California status for the Lesser Sandhill Crane as chiefly a more or less common migrant~ with flocks wintering in the San Joaquin Valley and Imperial Valley~ and at least formerly~ in the Los Angeles region. Numbers, however, in aggregate, had been obviously reduced in the last 30 yrs and "thousands" not now to be seen.

It was not until 1909 before the first California *G. c. canadensis* account was published; a specimen purchased at a Los Angeles market, having been shot about 19 km southeast of Los Angeles (Grinnell 1909). A bird in the California Academy of Sciences, however, was collected earlier, near Los Banos, Merced County, on 3 October 1897 (Mailliard 1921), but even in the 1880s the subspecies reportedly extended south into San Diego County (Bryant 1889). The lack of records in the late 1800s and early 1900s was perhaps attributable to reduced population numbers resulting from over-hunting in the Central Valley. It was in 1880 when excessive market hunting became a common California practice, and the slaughter continued until it was finally stopped with

passage of the Migratory Bird Act of 1916 (Littlefield and Thompson 1979). After 30 yrs of continual market hunting perhaps few cranes remained in the state. Swarth (1919) did collect several lessers near Corcoran, Kings County, in the winter of 1911-12, but generally few accounts were documented between 1890-1920. There is some evidence the population had begun to recover in the 1920s; McLean (1930), for example, noted 400 feeding in plowed corn at Los Banos on 13-14 March 1929, but it was not until the 1940s before the subspecies was again described as common, at least in some regions. Abbott (1940) stated lessers were fairly common near Salton Sea, in the Imperial Valley, in the winter of 1939-40.

As for historical numbers, no estimates are available. Most early-day ornithologist did not differentiate between sandhill crane subspecies, and those that did frequently misidentified greater from lessers. For sandhills in general, Newberry (1857) stated that in 1854-55, cranes in autumn and winter were abundant on the prairies of California, and were always for sale in the markets of San Francisco, where it was highly esteemed as an article of food.

Recent Range and Abundance

There have been no recent estimates for total PFP in the eastern segment, thus its present status is unknown. There is no evidence, however, to suggest that numbers have dramatically changed from the 20,000-23,000 estimated in the early 1980s (Littlefield and Thompson 1981). On the other hand, based on autumn counts on and near Sauvie Island, Oregon, the coastal segment has increased from about 1400 in 1981 to an estimated 3800 in 1998 (Littlefield 1999). Numbers were perhaps underestimated in the early 1980s, but overall more cranes are now using the coastal corridor. Until additional data become available, the total number of PFP lessers is perhaps between 23,800 to 26,800, with 25,000 a reasonable estimate.

Through the 1940s Lesser Sandhill Crane numbers substantially increased, and 3000 were estimated on Merced NWR in 1951; in the 1950s Merced numbers ranged from 1500 in 1952 to 21,500 in 1958 (Littlefield and Thompson 1981). Except for the Los Angeles Basin and the San

Diego region, their present wintering range is virtually the same as that described historically. Few, however, now winter in the Imperial Valley, whereas more winter in the northern Sacramento Valley. Center of winter abundance is still in Merced County, but in recent years more have apparently shifted northwest to the Delta. Only 4100 were recorded on the Delta in 1970 (Littlefield and Thompson 1981), but CBC data suggests some 10,000-15,000 may now be wintering in San Joaquin County. However, at the southern extremity of their range, CBC data suggests lessers reached a peak of abundance in the 1980s, but declined in the 1990s. For seven CBCs on the Carrizo Plains between 1983- 1989, mean number was 3979 (SD = 1095.2) and ranged from 3431 in 1985 to 5765 in 1986, whereas for nine counts between 1990-2000, mean number was 903 (SD = 909.62) and ranged from 2 in 1991 to 2900 in 1993.

Ecological Requirements

Sandhill cranes are omnivores, consuming invertebrates, amphibians, reptiles, eggs, small mammals and birds, and a variety of plant parts (Walkinshaw 1973); waste grains and other seeds are dominant foods in winter. Waste grains consumed include milo, corn, wheat (Walkinshaw 1973), rice (Guthery 1972), barley (Littlefield 1986), and oats (Madsen 1976). All of these crops are produced in California, but rice, wheat, and corn predominate. Waste corn is the principal food source for cranes in the San Joaquin Valley and on the Delta, whereas rice dominates in the Sacramento Valley. At Merced NWR, feeding habitat use as reported in narrative reports (1986-1993) include burned grasslands (especially if subirrigated), moist livestock grazed grasslands, pastures, mowed-unharvested corn, unaltered and tilled corn stubble, recently planted winter wheat, alfalfa, disced barley, resprouting clover, ungerminated trapper peas, milo, and burned rice stubble.

Similar feeding use occurs elsewhere in the state, with waste corn consumed in Stanislaus County, recently planted barley in San Joaquin County, wheat in San Luis Obispo County, and unaltered rice stubble in Butte County. Livestock grazed grasslands are frequently used throughout the Central Valley after the onset of winter rains; invertebrates consumed by cranes in grasslands

are necessary for daily activities and other physiological functions (Reinecke and Krapu 1986).

During spring migration, mowed and grazed meadows are used for feeding sites, whereas in autumn migration, harvested grain fields receive the most use.

In addition to obtaining high quality protein food; pastures, moist grasslands, and alfalfa fields also are used by Lesser Sandhill Cranes for loafing sites. Shallow wetlands are another important source for invertebrates, and also provide loafing sites for cranes in California. A loafing site used by cranes on the Carrizo Plains in 1977-78 was in grasslands with many rain-filled ephemeral ponds adjacent to Soda Lake; in drier winters, however, cranes loaf along the shoreline of this highly-alkaline lake (Gernon 1978).

Roost sites are in a variety of habitats. Physical features are level terrain, shallow water bordered by a sparsely vegetated shoreline, and in an isolated location with minimal human disturbance (Lewis 1976). Sites in California have included rain-pooled agricultural fields, shallow freshwater lakes and ponds, alkaline lakes, and shallow river channels where cranes spend the night standing in open water. Water depths generally range from 3-15 cm (pers. obs.). Though roosts are usually within 2 to 4 km of feeding sites, cranes will use sites at greater distances. For example, birds fed in wheat fields up to 10 km from roost sites on the Carrizo Plains in 1977-78 (Gernon 1978).

Threats

Industrial development in Washington, crane hunting, isostatic rebound, earthquake up lift, oil and gas exploration and development in Alaska, and utility wire collisions and diseases in California all contribute to threats or potential threats for the PFP of Lesser Sandhill Cranes (Littlefield 1999).

But one of the most serious threats is urban sprawl and changes in agricultural practices *in* the Central Valley of California; feeding habitat is being lost at a rapid rate. Grain field and irrigated pasture hectares continue to decrease as orchard, vineyard, and vegetable crop hectares continue to

increase. For example, in Butte County, in the Sacramento Valley, orchard hectares increased from 12,649 (31,243 acres) in 1959 to 29,169 (72,047 acres) in 1991, whereas corn declined from 3522 (8699 acres) to 364 ha (899 acres) in 1991, and barley from 14,980 (37,000 acres) in 1954 to 789 ha (1949 acres) in 1991. Rice, after peaking at 44,130 ha (109,000 acres) in 1981, dropped to 28,704 (70,899 acres) in 1991 (Littlefield 1993). On the Delta, in San Joaquin County, barley decreased from 3036 ha (7499 acres) in 1991 to 145 (358 acres) in 1998, milo from 159 (393 acres) to 0, and irrigated pasture from 10,769 (26,599 acres) in 1990 to 9676 (23,900 acres) in 1998 (Worthen and Gritz 1991, Curry and Rademacher 1998). Corn hectares dropped from 28,600 (70,642 acres) in 1980-82 (Pogson 1990) to 25,870 (63,900 acres) in 1998 (Curry and Rademacher 1998). On the other hand, vineyard hectares increased from 18,745 (46,300 acres) in 1991 to 31,093 (76,800 acres) in 1998. Hectares planted to vineyards in Sacramento County more than doubled in 3 yrs (Littlefield and Ivey 2000). Further south in the San Joaquin Valley, though vineyards and orchards increased only 2760 ha (6817 acres) between 1990-1998 in Merced County, tomatoes, Sudan grass, sugar beets, crops rarely used by cranes, increased 4430 ha (10,942 acres), whereas corn decreased 2267 ha (5600 acres), alfalfa 2788 ha (6886 acres), and of particular concern, 9919 ha (24,500 acres) of irrigated pastures have disappeared (Merced County Agricultural Reports).

As most grain crops in the Central Valley have declined in hectares, sufficient amounts of some have been maintained. However, there is a recently initiated program which will have an impact on crane feeding habitat. The program involves paying rice and other grain producers \$32/ha (\$13/acre) to flood stubble shortly after harvest in early November and maintain flooded conditions through the end of February. This 'Agriculture Waterfowl Incentive program' was designed to enhance waterfowl habitat. Except for minor roosting and loafing use, flooded grain fields are generally avoided by cranes (unlike ducks and geese, feeding cranes are highly inefficient

in finding small unexposed seeds). Should the program continue to gain momentum, it will certainly have a negative impact on the winter food resources available to Lesser Sandhill Cranes.

Except for occasional drought or flooding events, food has perhaps never been a limiting factor for sandhill cranes in the Central Valley, but recent trends in agricultural land use has and continues to reduce or eliminate crane feeding habitat. Though other threats exist for Lesser Sandhill Cranes of the PFP, farming practices, increased production costs, crop conversions, a waterfowl enhancement program, and new harvesting technology (see Miller and Wylie 1996) are the major ones now facing cranes in California.

Management and Research Recommendations

- Protect and enhance favorable grain crops on federal, state, and other conservation lands used by Lesser Sandhill Cranes.
- Provide unharvested corn plots on federal, state, and other conservation lands used by Lesser Sandhill Cranes in the Central Valley.
- Encourage farmers to delay disking grain crop stubble until after February, as deep disking buries waste grains.
- Encourage farmers and wildlife agency personnel to delay grain stubble burning or flooding until late February.
- Consider purchase or easements on major Lesser Sandhill Crane feeding areas in Merced and San Joaquin counties, and in other counties should major crane use areas be discovered or established.
- Encourage private landowners in northeastern California to maintain meadow habitat used by migrant cranes in spring.
- Protect and enhance shallow, sparsely vegetated wetlands within 2-4 km of major Lesser Sandhill Crane feeding areas to provide favorable roosting and loafing sites.

- Manage 20%-40% of grasslands in major crane use-areas with cattle grazing , to provide foraging sites for sandhill cranes.
- Vigorously oppose any utility corridor proposed through crane use-areas.
- Oppose all hunting activities within 0.4 km of crane roost sites and other use-areast and where possiblet restrict human access.
- Vigorously oppose any effort to allow sandhill crane hunting in the Pacific states and British Columbia.
- Conduct research on land-use practices and changes in the Central ValleYt and its impact on Lesser Sandhill Crane food availability and habitat.
- Conduct research on distribution of Lesser Sandhill Cranes in the Central Valley.
- Conduct research on the winter movements of Lesser Sandhill Cranes in the Central Valley and access causes for these movements.

Monitoring Needs

The eastern segment of the PFP of Lesser Sandhill Cranes should be monitored in the Central Valley of Californiat whereas monitoring those of the coastal segment can be accomplished at Sauvie Islandt Oregon and Ridgefield NWR (near Vancouvert Washington) w:lere surveys have been ongoing annually since 1991. California counts should be accomplished in Merced and San Joaquin countiest and completed in late October and early November before birds disperse to other regions within the San Joaquin Valley. Cranes can be counted as they depart roost sites in the early morning or arrive at sites in late afternoon. One of the major problems associated with surveying cranes in California is the observer's inability to identify lessers from greateres in the field.

Therefore, survey teams will have to be thoroughly familiar with sandhill crane subspecies.

The wintering population should be monitored every 3-5 yrs. In addition to counts, data need to be collected annually on population recruitment. Presently no data are available on age-

ratios, and little or none has been collected in the past 15 yrs. Recruitment surveys are done in October and November. The California Central Valley remains the only place on the Pacific Flyway where eastern segment Lesser Sandhill Cranes can be monitored with any reliability. Monitoring numbers and reproductive efforts should be initiated and pursued on a regular basis in the San Joaquin Valley and on the Delta as soon as possible.

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